

## CLAIMS

1. A electrolysis cell, comprising:  
a structure having at least one inlet channel for intake of water, a first outlet channel for output of hydrogen rich water, and a second outlet channel  
5 for output of Free Radical Solution water;  
said structure accommodates a flat proton ion exchange membrane placed in between two flat mesh electrodes;  
application of power to said electrodes electrolyzes water flowing through said inlet channel, generating Free Radical Solution water output  
10 through said first outlet channel and hydrogen rich water output through said second outlet channel.
2. The electrolysis cell of Claim 1, wherein each of said flat mesh electrodes is comprised of two layers with a first layer having large  
15 protuberances and a second layer having smaller protuberances compared with said first layer's larger protuberances.
3. The electrolysis cell of Claim 2, wherein said first layer with large protuberances is juxtaposed distal away from the proton ion exchange  
20 membrane surface, creating turbulence in flow of water adjacent said proton ion exchange membrane.
4. The electrolysis cell of Claim 2, wherein said second layer with smaller protuberances is juxtaposed facing the proton ion exchanged membrane.

5. The electrolysis cell of Claim 1, wherein said hydrogen rich water output through said second outlet channel is degassed for re-use.
- 5 6. The electrolysis cell of Claim 5, wherein said degassing of said hydrogen rich water produces hydrogen and water, with said hydrogen used for generation of electric power and said water recycled back to said electrolysis cell through said inlet channel.
- 10 7. The electrolysis cell of Claim 1, wherein power to said electrolysis is controlled by a control circuit.
8. The electrolysis cell of Claim 7, wherein said control circuit adjusts inlet water flow and/or electric power to maintain the most effective production of
- 15 FRS water and hydrogen rich water, or triggers a power shut-off signal to shut power off to said electrodes of said electrolysis cell based on information signals from a plurality of sensors that detect a variety of parameter values and output sensed signals based on deviation of normal parameter values from pre-programmed threshold levels.